

WHAT IS CLAIMED IS:

1 1. A programmable thermostat system for controlling space conditioning
2 equipment comprising:

3 A) at least one environmental condition sensor providing an electrical signal
4 indicative of the ambient temperature of a conditioned space in which said
5 environmental condition sensor is situated;

6 B) a transparent touch pad juxtaposed with a liquid crystal display to constitute a
7 touch screen for interactive interface with a user;

8 C) a processor, said processor including:

9 1) a central processing unit;

10 2) a real time clock;

11 3) a memory coupled to said central processing unit for storing program
12 and data information; and

13 4) an input/output unit coupled between said processor and said touch
14 screen for carrying out information transfer therebetween, said
15 input/output unit further including:

16 a) a sensor input coupled to each said environmental condition
17 sensors for receiving said electrical signal therefrom; and

18 b) a control output coupled to the space conditioning equipment for
19 issuing control signals thereto; and

20 D) a control program stored in said memory for causing said central processing
21 unit to communicate through said input/output unit to selectively:

22 1) establish on said liquid crystal display:

23 a) a representation of a first virtual button at a first predetermined
24 position on the liquid crystal display; and

25 b) a first legend indicative of a first control function of said
26 thermostat, which first control function is for controlling a first space
27 conditioning equipment component, which first control function is
28 active when the first legend is viewable;

29 2) read the position on the touch pad juxtaposed with said first
30 predetermined position on said liquid crystal display to determine if
31 the representation of said first virtual button has been touched;
32 3) if the first virtual button has been touched:
33 a) determining that the thermostat has been directed to control a
34 second space conditioning equipment component;
35 b) activating a second control function for controlling the second
36 space conditioning equipment component; and
37 c) displaying on said liquid crystal display a second legend
38 indicative of said second control function of said thermostat,
39 which second control function is for controlling the second
40 space conditioning equipment component, which second
41 control function is active when the second legend is
42 viewable.

1 2. The programmable thermostat system of Claim 1 in which said touch screen
2 comprises means for input by a user through the touch screen to establish in said
3 memory which space conditioning equipment components are controllable by said
4 thermostat.

1 3. The programmable thermostat system of Claim 1 in which the space
2 conditioning equipment components include at least one of: a heater, a compressor
3 type air conditioner and a heat pump.

1 4. The programmable thermostat system of Claim 3 in which if the first virtual
2 button is been touched again after step D)3), determining that the thermostat controls a
3 third space conditioning equipment component, activating a third control function for
4 controlling the third space conditioning equipment component, and changing the
5 second legend to a third legend indicative of the third control function of the thermostat.

1 5. The programmable thermostat system of Claim 4 in which one of the space
2 conditioning equipment components is a heater and the graphic includes the word
3 "heat" associated with said virtual button when the heater is controlled.

1 6. The programmable thermostat system of Claim 4 in which one of the space
2 conditioning equipment components is an air conditioning system and the graphic
3 includes the word "cool" associated with said virtual button when the air conditioning
4 system is controlled.

1 7. The programmable thermostat system of Claim 4 in which one of the space
2 conditioning equipment components is a heat pump and the graphic includes the word
3 "heat" associated with said virtual button when the heat pump is controlled while
4 operating in its heating mode.

1 8. The programmable thermostat system of Claim 4 in which one of the space
2 conditioning equipment components is a heat pump and the graphic includes the word
3 "cool" associated with said virtual button when the heat pump is controlled while
4 operating in its cooling mode.

1 9. A programmable thermostat system for controlling space conditioning
2 equipment comprising:

3 A) at least one environmental condition sensor providing an electrical signal
4 indicative of the ambient temperature of a conditioned space in which said
5 environmental condition sensor is situated;

6 B) a transparent touch pad juxtaposed with a liquid crystal display to constitute a
7 touch screen for interactive interface with a user;

8 C) a processor, said processor including:

9 1) a central processing unit;

10 2) a real time clock;

11 3) a memory coupled to said central processing unit for storing program
12 and data information; and

13 4) an input/output unit coupled between said processor and said touch
14 screen for carrying out information transfer therebetween, said
15 input/output unit further including:

16 a) a sensor input coupled to each said environmental condition
17 sensors for receiving said electrical signal therefrom; and

18 b) a control output coupled to the space conditioning equipment for
19 issuing control signals thereto; and
20 D) a program stored in said memory for causing said central processing unit to
21 communicate through said input/output unit to selectively:
22 1) establish on said liquid crystal display:
23 a) a representation of a first virtual button at a first predetermined
24 position on the liquid crystal display; and
25 b) a first legend indicative of a first control function of said
26 thermostat, which first control function is for controlling a first space
27 conditioning equipment component, which first control function is
28 active when the first legend is viewable;
29 2) read the position on the touch pad juxtaposed with said first
30 predetermined position on said liquid crystal display to determine if
31 the representation of said first virtual button has been touched;
32 3) if the first virtual button has been touched a predetermined number of
33 times:
34 a) determining that the thermostat has been directed to control a
35 plurality of space conditioning equipment components;
36 b) activating a second control function for controlling the plurality of
37 space conditioning equipment components; and
38 c) displaying on said liquid crystal display a second legend
39 indicative of said second control function of said thermostat,
40 which second control function is for controlling in
41 coordination the plurality of space conditioning equipment
42 component, which second control function is active when the
43 second legend is viewable.

1 10. The programmable thermostat system of Claim 9 in which the plurality of
2 space conditioning equipment components comprise a heating component and a
3 cooling component.

1 11. A programmable thermostat system for controlling space conditioning
2 equipment comprising:

3 A) at least one environmental condition sensor providing an electrical signal
4 indicative of the ambient temperature of a conditioned space in which said
5 environmental condition sensor is situated;

6 B) a transparent touch pad juxtaposed with a liquid crystal display to constitute a
7 touch screen for interactive interface with a user;

8 C) a processor, said processor including:

9 1) a central processing unit;

10 2) a real time clock;

11 3) a memory coupled to said central processing unit for storing program
12 and data information; and

13 4) an input/output unit coupled between said processor and said touch
14 screen for carrying out information transfer therebetween, said
15 input/output unit further including:

16 a) a sensor input coupled to each said environmental condition
17 sensors for receiving said electrical signal therefrom; and

18 b) a control output coupled to the space conditioning equipment for
19 issuing control signals thereto; and

20 D) a program stored in said memory for causing said central processing unit to
21 communicate through said input/output unit to selectively:

22 1) establish on said liquid crystal display:

23 a) a representation of a first virtual button at a first predetermined
24 position on the liquid crystal display; and

25 b) a first legend indicative of a first control function of said
26 thermostat, which first control function is for controlling a first space
27 conditioning equipment component, which first control function is
28 active when the first legend is viewable;

29 2) read the position on the touch pad juxtaposed with said first
30 predetermined position on said liquid crystal display to determine if
31 the representation of said first virtual button has been touched;
32 3) if the first virtual button has been touched a predetermined number of
33 times:
34 a) determining that the thermostat has been directed to refrain from
35 controlling any space conditioning equipment components;
36 b) activating a second control function which prevents controlling
37 any space conditioning equipment components; and
38 c) displaying on said liquid crystal display a second legend
39 indicative of said second control function of said thermostat,
40 which second control function is active when the second
41 legend is viewable.

1 12. The programmable thermostat system of Claim 1 in which said liquid crystal
2 display is a dot matrix type.

1 13. The programmable thermostat system of Claim 2 in which said liquid crystal
2 display is a dot matrix type.

1 14. The programmable thermostat system of Claim 4 in which said liquid crystal
2 display is a dot matrix type.

1 15. The programmable thermostat system of Claim 5 in which said liquid crystal
2 display is a dot matrix type.

1 16. The programmable thermostat system of Claim 6 in which said liquid crystal
2 display is a dot matrix type.

1 17. The programmable thermostat system of Claim 7 in which said liquid crystal
2 display is a dot matrix type.

1 18. The programmable thermostat system of Claim 8 in which said liquid crystal
2 display is a dot matrix type.

1 19. The programmable thermostat system of Claim 9 in which said liquid crystal
2 display is a dot matrix type.

1 20. The programmable thermostat system of Claim 11 in which said liquid
2 crystal display is a dot matrix type.
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